Seventh Report of the National Heart, Lung, and Blood Advisory Council

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, Public Health Service, National Institutes of Health

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A Report and a Projection from the
National Heart, Lung, and Blood Advisory Council
to the President
and the Congress
of the United States

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
National Institutes of Health
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"...to advance the national attack against diseases of the heart and blood vessels, the lungs, and blood..."

National Heart, Blood Vessel,
Lung, and Blood Act of 1972
Public Law 92-423
92nd Congress

INTRODUCTION

The purpose of this year's report is to—

- Describe recent accomplishments that have advanced the National Heart, Lung, and Blood Institute's program to control and prevent diseases of the heart, lungs, and blood.
- Comment on factors that speed or retard progress.
- Recommend a budget.

The first part of the report describes recent exciting advances in research, along with their practical applications. These advances are among the latest fruits of a research continuum that began with the establishment of the National Heart Institute in 1948.

In the second part of the report, the Council considers several issues important to the well-being of the National Heart, Lung, and Blood Institute (NHLBI) and to the success of its programs—issues that have sometimes affected progress adversely.

Finally, the Council reaffirms its support for the Institute's goals and recommends a budget to meet these goals.

Recent Developments in Research

THE HEART AND BLOOD VESSELS

The last 30 years have seen a remarkable fall in the number of deaths from heart disease. Today, disorders of the cardiovascular system kill Americans at a rate one-third less than that in 1948, the year the Institute came into existence.

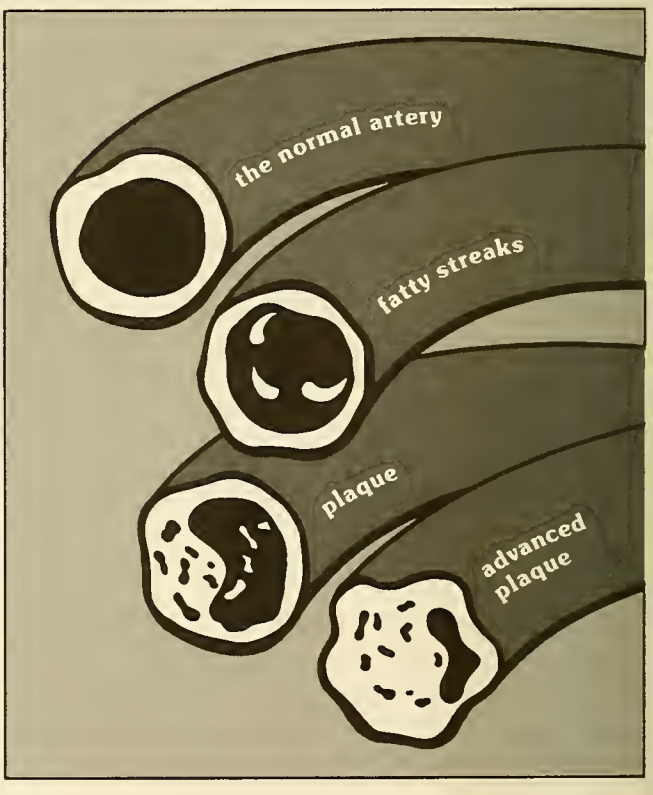
A most important factor in this decline has been the success achieved by the Institute in gaining new knowledge through research, and in educating people about cardiovascular disease, especially the ease of diagnosis of hypertension and the success of treatment for it. Not only have people begun to have their blood pressure measured regularly, but scientists have developed an array of drugs that are effective in lowering elevated pressure into the normal range and in thus returning life expectancy to normal. A second factor has been more rapid and better treatment of heart attack. Other factors that have probably contributed include increased public awareness of the adverse effects of cigarette smoking and the possible benefits of exercise and a prudent diet.

Despite the encouraging downward trend in mortality in the United States, cardiovascular disease remains the number one killer. It still accounts for over 50 percent of all deaths—more than twice as many deaths as cancer.

Atherosclerosis

The disease underlying heart attacks and most strokes is atherosclerosis, a disorder in which the inner layer of the artery wall becomes thick and irregular because of an increase in the number of cells in this layer. This increase in cells is accompanied by deposits of fatty substances and other materials. The lesions that result are known as atherosclerotic plaques. As these plaques build up on the inner surface of the arteries, they eventually precipitate blood clots on the surface (thrombosis) or grow large enough to occlude the vessels, thus depriving organs and tissues of the blood flow and oxygen they need. In occlusion of the coronary arteries, oxygen reaching the heart may be insufficient to maintain the vigorous, rhythmic contraction of the heart muscle. Even an incomplete occlusion can so reduce blood flow that the heart beats erratically, and the volume of blood it pumps through critical organs falls below the level needed to sustain life.

Two areas of fundamental research to learn the cause of atherosclerosis have recently provided new hypotheses about the way atherosclerotic plaques develop. One line of research has centered on vascular smooth muscle, which forms the contractile walls of arteries, and which regulates the caliber (size of the opening) of the arteries by contraction and relaxation. Recent studies have shown that platelets, tiny cell-like elements in the blood, contain a substance that stimulates the proliferation of vascular smooth muscle cells. The platelets appear to be capable of initiating formation of the lesions of atherosclerosis. Further analysis of artery wall and platelet interaction will increase our understanding of the development of this disease.



The other line of investigation has increased our understanding of the function of the cells that line the artery wall. These cells normally form a protective barrier for the blood, and have been shown to manufacture a compound called prostacyclin. Prostacyclin helps prevent occlusion of the artery by increasing its caliber (and thereby helping to maintain an adequate flow of blood) and by preventing the formation of thrombi, or plugs of clotted blood and cells. (This is discussed at greater length under "Thrombosis," on page 7.)

Among the blood constituents important to atherosclerosis, two others that have long attracted attention are the lipids and lipoproteins. However, new knowledge of the deleterious effects of low-density lipoproteins (LDL), as compared with the apparently "protective" effect of high-density lipoproteins (HDL), has stimulated new efforts to study and understand lipoprotein metabolism. It has been discovered that HDL can act as an acceptor of cholesterol from artery wall cells. Thus, it serves as an antagonist to the development of atherosclerotic plaques, or perhaps even to reduce such plaques. This has led investigators to

experiments at the molecular level, experiments that could eventually point the way to new avenues of prevention and treatment of atherosclerotic disease. The Institute's solicitation this year of proposals for research on diet and HDL represents a deliberate and coordinated effort to increase understanding of these topics.

Diabetes

Cardiovascular disease is the cause of death in 80 percent of people with diabetes. Moreover, diabetes has been implicated as a risk factor in coronary heart disease. The heavy toll of diabetes in sickness and death is understandable in the light of recent observations that the disease is associated not only with disturbances in the metabolism of sugar, but also with obstructive changes in blood vessels in the eyes, kidneys, brain, heart, and legs.

The National Heart, Lung, and Blood Institute supports many studies related to diabetes, focusing particularly on its cardiovascular consequences. In addition, NHLBI-sponsored epidemiological investigations and clinical intervention trials include studies of diabetes as one of several predisposing risk factors for cardiovascular disease.

In conjunction with the National Institute of Arthritis, Metabolism, and Digestive Diseases (NIAMDD), the Institute has initiated a special-emphasis research career award in cardiovascular, metabolic and endocrinologic aspects of diabetes. The award's purpose is to encourage qualified people, early in their postgraduate medical and scientific careers, to develop research interests and skills in these aspects of diabetes. The Institute has also cooperated with NIAMDD in the planning of a 5-year study to assess the effect of treatment of juvenile-onset diabetes, the most serious form of the disease, on the development of complications in both large and small blood vessels.

Hypertension

An NHLBI task force, working for more than 24 months, has produced an extensive review of the current status of research on the mechanisms that control blood pressure, on methods of diagnosis, and on plans for management of hypertension, and has pointed out directions for future work. This "Report of the Task Force on Hypertension" will be invaluable to scientists and physicians trying to prevent or control hypertensive disease. Also, the High Blood Pressure Detection and Follow-Up Program, now drawing to a close, will provide important information about the management of hypertension in the community.

The ongoing National High Blood Pressure Education Program, which the Institute has coordinated, has produced major changes in both professional and public awareness and understanding of hypertension. This has led, in turn, to a twofold increase in the number of people whose hypertension is under good control.

Noninvasive Diagnostic Techniques

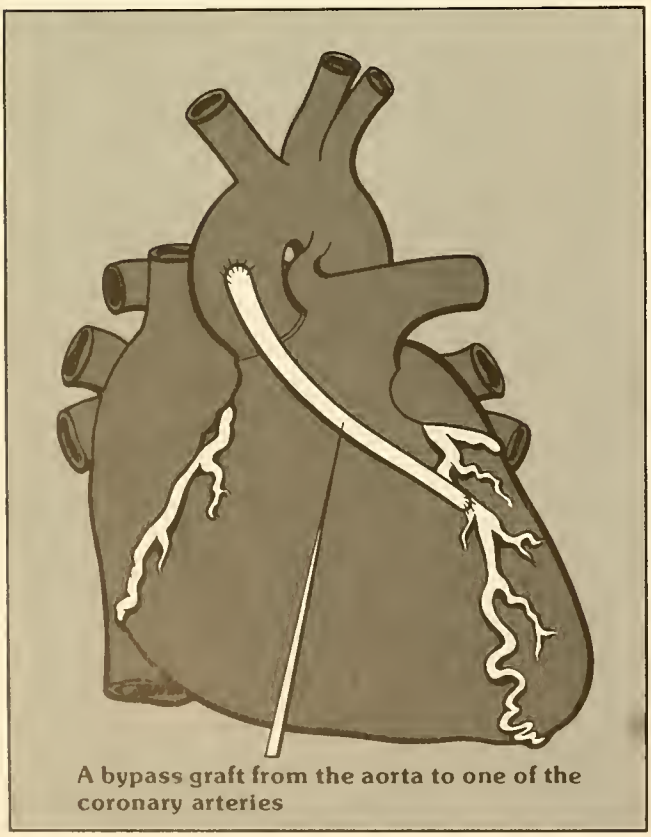
In addition to fundamental research on atherosclerosis and hypertension, investigators supported by the NHLBI have developed new noninvasive methods of studying the living heart and blood vessels. These have provided insights about the heart and vessels that would not otherwise have been possible. For example, beta-scan ultrasound devices that are safe and painless have been developed; they enable investigators to visualize, from outside of the body, lesions in the arteries of the legs and in the carotid arteries of the neck. With these devices, it may also be possible to observe changes in the size of atherosclerotic plaques. With further development, these instruments should permit analysis of lesions in large numbers of patients and should help investigators evaluate the effects of various forms of treatment on atherosclerosis. Future refinement of these noninvasive devices may make direct examination of coronary arteries possible without the inconvenience and risk of entering the vascular system with needles and tubes. Because of the continuous movement of the heart, such examination presently poses greater problems than those presented by arteries of the limbs. Progress is expected in this important area as well.

Other Developments

We have here reviewed briefly some advances in our understanding of atherosclerosis and hypertension and in

the development of noninvasive diagnostic techniques. Other activities in which significant progress has been made include:

- The investigation of a class of drugs known as beta-blockers to see whether these drugs, if taken daily after a heart attack, will protect a person from sudden death.
- The invention of new artificial heart valves and artificial segments of vessels.
- The design of support devices to help the heart maintain its pumping function during the acute period just after a heart attack.
- The further development of coronary artery surgery (coronary bypass), which has provided substantial relief of pain for many cardiac patients.
- Improvements in safety procedures for cardiac surgery that have reduced operational risk to a dramatically low degree, especially in operations for blocked coronary arteries.
- The use of radioactive isotopes in evaluations of the state of the heart muscle and in assessment of the heart's effectiveness in pumping blood.



A bypass graft from the aorta to one of the coronary arteries

- More advanced analysis of the origin of attacks of arrhythmia—episodes in which the heart beats so erratically, or so fast or slowly, that it fails to pump the blood efficiently.
- Continuing progress toward answering vitally important questions about the treatment and prevention of cardiovascular diseases. Now in progress are a broad array of basic investigations of functions of the heart and circulation that should lead to new diagnostic and therapeutic approaches to heart disease and stroke.
- Savings to the public of over $40 million a year by an Institute-supported clinical trial (Coronary Drug Project), which determined that a widely prescribed drug believed to decrease heart attack deaths was not effective. The results of this study have been published and discussed widely, and prescriptions for this agent have been greatly reduced. Other controlled clinical trials are evaluating the feasibility and effects of reducing risk factors for cardiovascular disease.

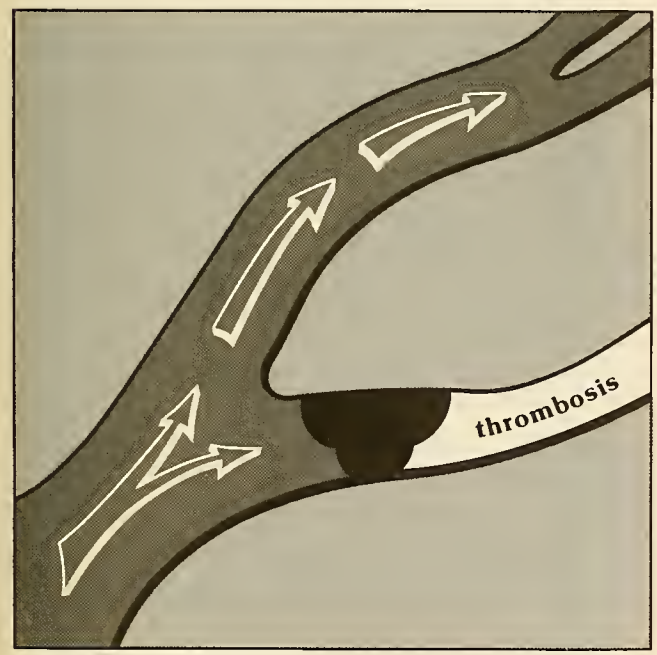
The Institute's cardiovascular research programs have been and continue to be remarkably productive. Progress is being made on multiple fronts, both at the basic level and at a practical level that directly affects patient care.

THE BLOOD

Thrombosis

Thrombosis, a condition caused by the aggregation of platelets and fibrin, with entrapment of other cellular elements, is an extremely important area of blood research. Such research has far-reaching implications in relation to circulatory complications that occur after many surgical procedures, and to obstruction of blood vessels associated with fatal or near-fatal heart and cerebrovascular conditions.

Platelets produce a potent aggregator, called "thromboxane A_2," which causes the platelets to stick together and thus contributes to the formation of the dangerous thrombus. In the blood vessel wall, however, a "lining" cell produces a substance, called "prostacyclin," which inhibits the aggregation of platelets and thus prevents the formation of a thrombus and perhaps even the lesions of atherosclerosis.



Aspirin also inhibits platelet aggregation, but it does so by interfering with the production of thromboxane A_2. Researchers have now demonstrated that while the biochemical mechanism in the lining cells that produces the valuable protector prostacyclin is also sensitive to aspirin, it takes a much higher dose of aspirin to inhibit this system. The challenge, therefore, is to determine what dosage of aspirin will inhibit the platelet-aggregating factors without depressing the production of prostacyclin (the substance in endothelial cells that also helps prevent platelet aggregation). The answer may provide the basis for the use of aspirin in the prevention of thrombosis.

Thalassemia

Among the numerous recent advances that have been made in blood research is the development of improved methods for treating thalassemia, or Cooley's anemia, a severe inherited blood disorder that occurs primarily in persons of Greek, Italian, and Oriental ancestry.

Thalassemia manifests itself shortly after birth. In this disorder, the red blood cells that normally carry the oxygen-transporting pigment hemoglobin are impaired in their ability to produce hemoglobin. The result is a severe anemia that can be treated only by blood transfusions.

These transfusions have the unfortunate side effect of causing an accumulation of iron in vital organs such as the heart, liver, and kidneys, which can lead to the death of the individual, usually before the age of 30. Now, however, transfusion therapy can be combined with the administration of substances called chelators, which bind iron and facilitate its removal from the body. Thus, a balance can be struck between the amount of iron taken in by the patient on transfusion therapy and the amount lost through drug treatment. It is hoped that the use of chelators will prolong the lives of people with thalassemia.

Attempts to find more effective chelators and better ways to administer them must continue, but the currently used method of treatment is already permitting these young people to develop normally and lead productive lives almost free of discomfort.

Sickle Cell Disease

Sickle cell disease is a form of anemia in which many of the red blood cells distort into a "sickle" shape that obstructs blood flow. The patient suffers painful episodes, or crises, and damage to vital organs.

A new method of prenatal diagnosis of sickle cell disease has been developed. The process utilizes amniocentesis, a technique for obtaining a sample of the fluid that surrounds a fetus. The genetic material present in the fetal cells found in this fluid can be analyzed for a certain identifiable and measurable characteristic associated with sickle cell disease in most of the unborn children who are at risk. This technique is safer than other prenatal diagnostic methods, which require a sample of fetal blood, the procurement of which carries a 5 to 10 percent possibility of injury to the fetus.

The search for a means of treating sickle cell disease continues. Most of the promising drugs, such as cyanate, are toxic when given orally. An alternative method has been devised for administering cyanate, in which the patient's blood is passed through a continuous-flow system, outside the body. This permits the administration of cyanate to the

A sickle cell

red blood cells, the removal of excess cyanate, and the return of the treated blood back into the patient.

The feasibility of this technique has been demonstrated successfully in experiments with animals, and a small trial has been initiated to assess its effectiveness in patients with sickle cell disease. In the meantime, an empirical evaluation of other possible methods for treating sickle cell disease should result from information obtained from the recently initiated study of the natural history of this disease. In this study, the participating clinics will observe, according to a strictly defined protocol, the clinical course of sickle cell disease from birth through adulthood.

Other Developments

The blood research program of the NHLBI has provided important new information in other areas, such as the following:

- A remaining hazard of blood transfusion is the transmission of a form of hepatitis referred to as "non-A, non-B hepatitis" that cannot be detected by current tests for hepatitis. Researchers have now succeeded in transmitting some of these forms of hepatitis from the blood of infected humans to chimpanzees. The experimental transmission of hepatitis provides researchers with a much-needed animal model for studying the disease, as well as for detecting it in humans.

- A continuous-flow plasmapheresis system has been developed that reduces the time required for collecting plasma from 90 minutes to 30 minutes. This technique of selectively removing plasma permits an increase in the availability of plasma and specific components of plasma, such as the antihemophilic factor, for direct use in patients. The improvement in the ease of donating plasma should encourage more people to volunteer as donors.

- New techniques have also been developed for collecting and storing the individual "formed elements" of blood. Thus, physicians can now treat patients with transfusions of specific types of blood cells needed to correct specific conditions. This precise therapy avoids the hazards associated with the use of whole blood for transfusions, and also allows conservation of blood components not actually needed by the patient.

Although the aforementioned examples indicate that the NHLBI's research program in blood diseases and blood resources has produced significant accomplishments, much remains to be done. For example, if we could screen donors for the presence of non-A, non-B hepatitis, we could essentially eliminate the danger of hepatitis in blood transfusions. Other items of high priority include the development of a safe and painless way to prevent the crises experienced by patients with sickle cell disease. We also need to develop a dependable means of preventing deep-vein thrombosis, which is a frequent cause of complications, and even death, after surgery.

THE LUNG

The Division of Lung Diseases has made remarkable progress since it was established as part of the Institute in 1969, a decade ago. Innovative approaches to the training of young scientists, for example, have met with gratifying success. The Division has designed and implemented Pulmonary Academic Awards, Pulmonary Faculty Awards, and Young Investigator Awards. At the same time, the Division has sponsored Specialized Centers of Research in airways disease, pediatric lung disease, pulmonary vascular disease, immunologic and fibrotic disease, and respiratory failure.

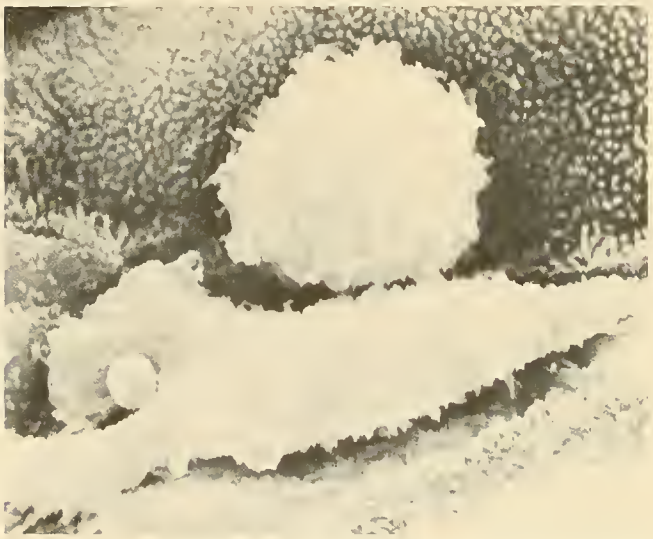
The Division has developed contract programs in multiple areas, while continuing to support investigator-initiated projects. In short, the Division, on this its 10th birthday, can be proud of its accomplishments.

Diseases of the Airways

The Division has placed special emphasis on research in diseases of the airways. In contrast to the falling mortality from cardiovascular disease, there is a continuing rise in deaths from chronic bronchitis, emphysema, and asthma (referred to collectively as chronic obstructive lung disease, or COLD). However, it is uncertain to what extent this rise represents increased occurrence or severity. Part of the increase may be due to the increasing frequency with which physicians detect and report these diseases as causes of death. This has been made possible by improved diagnostic tools developed through support of the NHLBI's Division of Lung Diseases and through the Institute's support of improved physician education and training.

Foremost among the techniques aimed at prevention and control of COLD are antismoking efforts, designed to promote cessation of smoking in adults and to promote increased awareness in young people of the need to avoid starting. Further, improved methods for detecting lung disease in its early stages are making it possible to advise cessation of smoking and other preventive measures before damage to the lung becomes permanent.

One type of obstructive airway disease is hereditary and is associated with deficiency of a substance in the blood called alpha$_1$-antitrypsin. This is a substance that suppresses the effect of trypsin and other enzymes that have the potential for attacking the lung. Research has shown how the enzyme acts, has led to its production in cell cultures, has revealed its molecular character, and has stimulated efforts to treat animals with purified or synthetic preparations.



Scanning electron micrograph of two alveolar macrophages. The macrophage at the bottom is about to devour a foreign particle.

Diseases of the Lung Tissue

New findings on connective tissue components of the lung and on pulmonary macrophages (large cells that act as scavengers in the lung) indicate that the latter are a source of elastase, an enzyme capable of attacking the elastic fibers of the lung. Cigarette smoking increases the release of elastase. Destruction of elastic tissue in the lung is known to be involved in the development of emphysema. Studies of the biosynthesis of components of the lung connective tissue and of the characterization of lung cells promise to shed light on normal lung structure and its alteration in disease.

The general principle of identifying people at highest risk of serious disease, and of concentrating preventive and therapeutic efforts where they are most needed and can do the most good, has been applied effectively to the problem of respiratory distress in the newborn. In this case, pregnant women and their babies are examined during pregnancy and monitored during labor. Prediction of birth asphyxia or respiratory distress syndrome (RDS) from knowledge of risk factors is now about 80 percent accurate. These risk factors include a shortened length of gestation, abnormal fetal responses during labor, occurrence of RDS in a previous delivery, diabetes in the mother, and a history of cesarean section.

Continuing basic research into lung development is providing promising leads about the way the fetal lung matures. It is expected that such research may provide clues that lead to the prevention of respiratory distress syndrome.

Another lung disease of childhood is cystic fibrosis (CF). Although CF is known to be inherited, it has become clear

that the disease is not uniform; it varies in severity, course, and outcome. Until recently, little was known about the basic defect of cystic fibrosis or the range of pathological changes that occur—with the result that treatment was often ineffective or even harmful. In recent years, however, there has been an infusion of scientific research into all aspects of the problem, which includes identification of the basic defect, recognition of those afflicted, and study of the natural history of the disease and of the effects on its course of different types of management and treatment. The implications for the future range from prevention, through genetic counseling, to control and alleviation of morbidity and premature death, through treatment.

Respiratory Failure

Respiratory failure, in both adults and children, is a serious condition that can result from many types of lung injury or disease. Occasionally, it may occur because the lung has been damaged during major surgery or other medical procedures, including administration of oxygen or certain drugs. Early diagnosis and effective treatment can, in many cases, prevent the otherwise fatal outcome.

In the 1970's, the most dramatic decline in deaths due to respiratory disorders has occurred in acute respiratory failure. In this disorder, new knowledge of respiratory physiology, gained through basic research and applied to the development of sophisticated technology, has revolutionized life-support systems in hospitals and in emergency-care vehicles. Intensive care units now have elaborate supplementary breathing devices, monitors for breathing rate and depth and for concentration of oxygen and carbon dioxide in the respired air, and computers to analyze changes in the patient's condition and correct for them automatically. New techniques such as PEEP (positive end-expiratory pressure) have greatly improved survival following automobile accidents, major surgery, and acute influenzal pneumonias. These conditions affect not only the chronically ill, but also—and much more often—otherwise healthy individuals.

There is still a great need to develop technology that will take over the life-giving function of the lung during temporary periods of acute lung failure. Extracorporeal membrane oxygenation can perform that function during the brief periods associated with chest surgery, but it does not work adequately over the emergency period of acute lung failure, which may last several days.

The need for effective treatment is most pressing for people with healthy lungs who need assistance for only a brief period of respiratory failure, and who can be expected to regain their former health if they are tided over the emergency. Before such an advance can be made, however, more will have to be learned about physiological and pathological processes in the lung that are not now understood.

Early Diagnosis of Lung Disease

Because successful lung therapy requires both accurate early diagnosis and continuous monitoring of functional changes during treatment, programs have been undertaken to develop and evaluate a variety of diagnostic and monitoring techniques and devices. Noteworthy examples include the fiberoptic bronchoscope for visualization of small airways and collateral channels to the alveoli (tiny air sacs in the lung), refinements in chest radiography, and assessment of lung water. Important challenges for the future are noninvasive assessment of pulmonary hypertension and pulmonary embolism and methods to evaluate pulmonary function in infants and young children.

Other Developments

In addition to the progress made in the research mentioned above, advances have also been made in the following areas:

- Much has been learned about extrarespiratory functions of the lung. It has recently been discovered, for example, that the lungs metabolize or detoxify many chemical compounds in the blood.

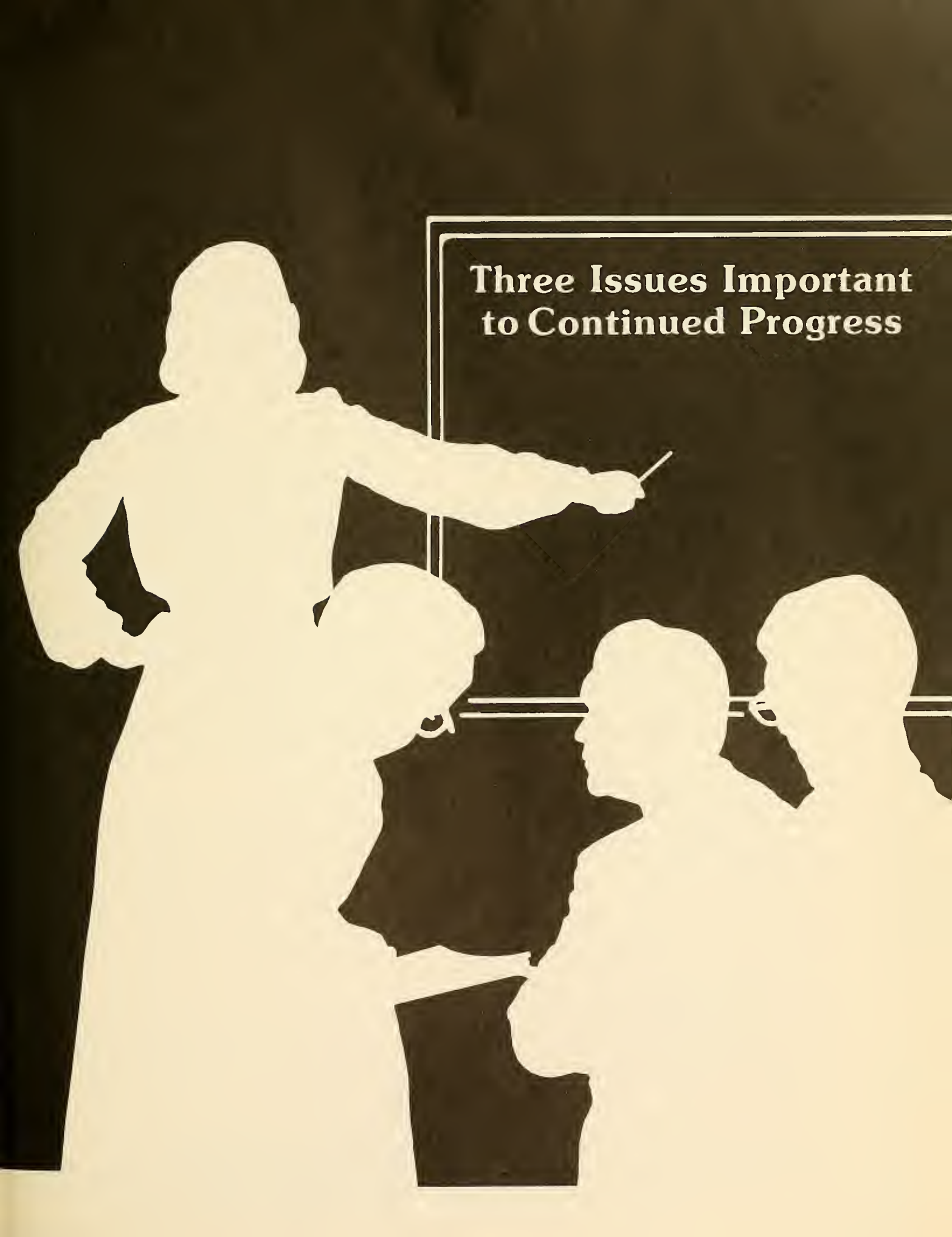
- The role of the lung in immunologic reactions is receiving increased attention.

- Use of fiberoptic bronchoscopy and percutaneous (through the skin) lung biopsy have increased the ease and accuracy of diagnosis.

- Analysis of disease processes set in motion by environmental substances and identification of additional lung-damaging substances have improved the prospect for dealing with related diseases.

- Improved capabilities of mechanical respirators have made it possible to sustain life in patients who in the past would have died.

In summary, the Division of Lung Diseases has made great strides in the first decade of its existence.


Three Issues Important
to Continued Progress

ISSUE #1: SCIENTIFIC MANPOWER

The past two decades have seen a steady decline in the number of young scientists seeking careers in research, especially young men and women who hold M.D. degrees.

In the late 1950's, approximately 1,000 newly trained physicians applied each year for NHLBI research training support that would enable them to learn the rudiments of research in diseases of the heart, lungs, and blood. This year the number has fallen to fewer than 500, and next year, if the trend continues, the number will be smaller still. Unless ways are found to restore the luster of careers in clinical investigation, health care in this country will suffer irreparable damage. There is, therefore, a great need to study the factors that have contributed to the problem, in the hope that steps can be taken to reverse the downward trend.

One important factor has been a shift in national priorities. Young physicians who completed their medical training in the late 1960's and early 1970's were subjected to persuasive arguments, both from their medical schools and from the press, that health-care delivery deserved their highest priority. These physicians, many of whom had been through the Vietnam war, were especially sensitive to such arguments. With the intention of using their medical knowledge to meet the greatest perceived need, virtually all of them decided to spend their lives practicing medicine, rather than performing research—including many who would otherwise have chosen research careers.

Another factor of unquestioned importance is the growing competition for research dollars. This has reduced the funds available for investigator-initiated studies—and this has become evident to medical students and house officers, who see faculty members investing large amounts of time and effort in writing grant applications, with diminishing chances of success.

At the same time, hopeful prospective researchers among these young people have had the opportunity to compare the incomes of physician-researchers with those of physicians in practice and those engaged in institutional care, and they find the comparison unfavorable. Opportunities in VA hospitals, in HMO's and private groups, and in the private practice of medicine, have become more attractive than ever before. In the past, most of these offered little competition to research; today, they provide a major inducement to stay away from it.

Still another factor has been the level of stipends paid to research trainees. During the past 30 years, these stipends have not kept pace with the salaries paid residents in clinical training. As a result, moving from a resident's salary to a fellowship stipend has involved an increasingly greater financial sacrifice. For example, in cities where the salaries of residents are tied to the cost of living, the range for residents extends from $18,000 to $22,000. A research fellowship stipend, in contrast, pays from $12,000 to $14,000—one-third less.

The prospect of trying to support a family on $12,000 in these days of an inflated economy has forced more and more young physicians to turn their backs on research. Another powerful deterrent is the ever-present specter of the "pay-back clause." A trainee who decides to leave research must return the dollars the Government has contributed to the stipend.

Happily, this past year has seen the NIH and the NHLBI take two important steps in dealing with this problem. The first step has been to implement an NIH-wide increase in stipends. The second has been to offer a special clinical investigator award, originated and sponsored by the NHLBI, to attract young physicians into research at an early stage in their careers. These important and constructive steps should serve as cornerstones for designing a detailed, specific long-range plan.

As such planning moves forward, it will be imperative to keep in high focus the negative factors that have in the past contributed to this unfortunate and inequitable differential between the rewards of medical research and those of clinical practice. Awareness of these factors and their adverse effect on medical progress is a necessary prelude to the kind of planning of career-building inducements that will once again ensure a large and strong corps of young investigators.

ISSUE #2: ADMINISTRATIVE PERSONNEL

During the 30 years since the NHLBI came into existence, the Institute has had two clearly defined priorities: (1) to build a strong extramural program of research in universities around the country, and (2) to build a strong intramural program of research and patient care at the Institute itself. That these should have been the initial priorities was altogether fitting. Moreover, the Institute has pursued these priorities with outstanding success.

But now, as the Institute matures, a third objective requires attention. This is to improve the status of the administrative staff of the Institute, a group of men and women whose work is critical to the vitality of the programs in science.

At the moment, the administrative staff is beset with problems. Salaries have been raised, but are still not competitive with those paid in medical schools, the most appropriate source of personnel for the Institute's specialized

type of administrative functions. Moreover, anyone who leaves a school to join the Institute's staff must give up some of the satisfactions of an academic atmosphere, since there is little contact with students or physicians-in-training, and there is little opportunity to teach. Further, anyone experienced in research has to give up this activity also, since no provision has been made for investigators who join the administrative staff to continue their research pursuits. The net result of all such policies is to force anyone who is qualified for such activities (which by instinct and training are a component of his or her professional objective) to give them up in order to join the Institute's staff.

Another problem that affects morale is the physical separation of the NHLBI staff into three groups. The members are currently split between three geographic locations—the NIH reservation, the Federal Building, and the Westwood Building. This separation reduces efficiency and impedes the building of a spirit of unity and cohesion. It also limits the opportunity to exchange ideas and opinions, a condition essential for continual intellectual growth.

The Institute has a further problem with administrative staffing, one that has broad implications. There has been a steady increase in the Institute's responsibilities and administrative workload, without a corresponding increase in personnel. The staff has not grown at a rate proportional to the tremendous expansion in workload. It is appropriate to point out, in this context, that another significant increment has been added to the load by the recent ruling that grant applicants may have copies of their summary sheets, and may then respond to the criticisms of the Study Sections.

For all these reasons, the Council recommends a review of staffing policies, with an eye to increasing the attractiveness of administrative jobs. Failure to do this will inevitably weaken the administrative arm not only of the NHLBI, but also of all the Institutes at the NIH, and will eventually affect their programs, both extramural and intramural.

ISSUE #3: STABILITY OF FUNDING

The need for more stable funding is not unique to the NHLBI. It affects the operation of all sections of the NIH. In simple terms, the Institutes are asked to support research on a continuing long-term basis through appropriations that are potentially discontinuous because they must be negotiated in their entirety every year. The Institutes are also asked to respond to new mandates, often without allocation of new funds. And since the Congress is, in the last analysis, the instrument that decides on the annual budget, the budget is determined by a group whose membership is continually changing. Thus, long-range planning, an awkward enterprise under ideal conditions, becomes incredibly difficult and complex.

Moreover, negotiations between the Executive and Legislative Branches over the size of the budget are often so prolonged that no budget is available at the beginning of a fiscal year. This uncertainty and lateness make orderly planning difficult not only at the Institute level, but also for scientists and investigators throughout the country who supervise research projects. In several recent instances, the Institute's appropriation was delayed so long that even in the spring, investigators had no assurance of salaries come July 1. Under such circumstances, biomedical investigators face a problem that is at best difficult, at worst impossible.

The Council is aware that this problem exists throughout the Government and that the NHLBI is not the only victim. But scientific research projects, which by their nature require continuity of study over long periods, are particularly vulnerable to damage from discontinuity of support. The Council therefore heartily endorses the principle of maintaining uninterrupted, stable support for the pursuit of scientific research. Otherwise, the present unsatisfactory arrangement will further aggravate the loss of young investigators and increase the disruption and loss of their research projects—projects that are critically important to the health and well-being of our country.

A Statement by the Council and a Recommended Budget

THE MEMBERS OF THE COUNCIL are pleased to endorse the programs of the Institute and to voice their enthusiastic support for the staff. Despite the several issues that in the Council's opinion require urgent attention, the National Heart, Lung, and Blood Institute is in an excellent state.

To ensure that the Institute's program can be pursued as vigorously in the next fiscal year as it has been in the past, the Council recommends the budget set forth below. The amounts were chosen after wide consultation and after attempting to allow for inflationary changes that have eroded the purchasing power of the dollar.

The National Heart, Lung, and Blood Advisory Council's recommended annual budget for fiscal years 1981-1984.

PROGRAM ACTIVITIES	FISCAL YEAR			
	1981	1982	1983	1984
	(dollars in thousands)			
Extramural Research Programs				
Heart and Vascular Diseases	$376,000	$414,000	$ 553,000	$ 573,000
Lung Diseases	95,000	105,000	115,000	130,000
Blood Diseases and Blood Resources	95,000	105,000	115,000	130,000
Prevention, Control, and Education	38,000	42,000	46,000	61,000
Construction	22,000	22,000	30,000	40,000
Manpower	41,000	44,000	47,000	57,000
Total Extramural Research Programs	$667,000	$732,000	$ 906,000	$ 991,000
Intramural Research Programs	47,000	49,000	52,000	62,000
Program Management and Program Services	36,000	39,000	42,000	47,000
TOTAL	$750,000	$820,000	$1,000,000	$1,100,000

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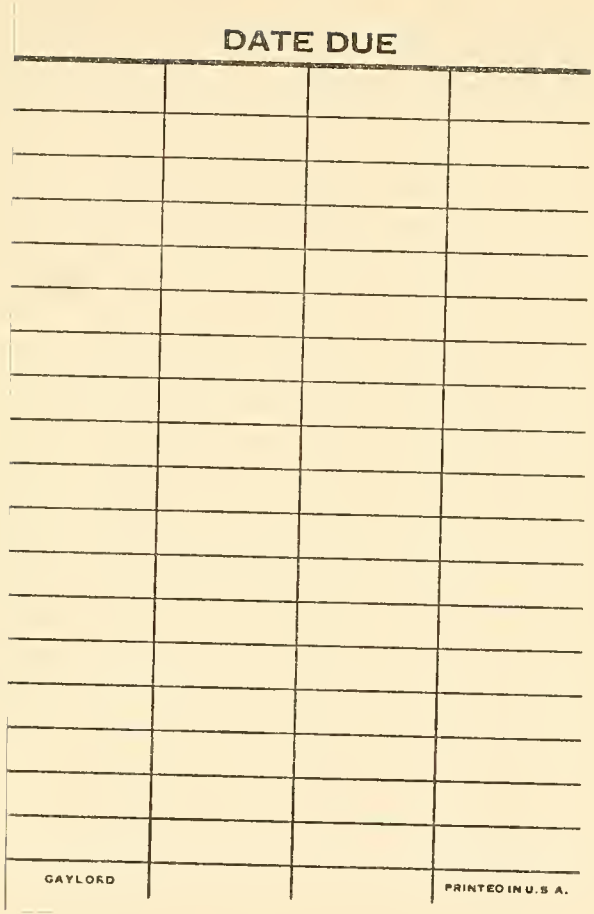

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